

NEW SPECIES OF VERNONIEAE (ASTERACEAE). VII.

FIVE NEW SPECIES OF *VERNONIA* FROM BRASIL.

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Collections of additional new species of *Vernonia* have recently been obtained from a number of sources. The present paper is primarily to furnish names for the two species collected by R. M. King, one of which is a voucher for chemical analysis. The new species collected by Dr. Calderon comes from one of the botanically least known regions of Brasil in southern Amazonas. The remaining two species are also from poorly botanized regions in southern Pará. The latter three species all occur in regions rather isolated from the better known centers of Vernonian diversity in Brasil.

*VERNONIA* ALMEDAE H. Robinson, sp. nov.

Plantae suffruticosae erectae ca. 1 m altae non vel paucè ramosae. Caules brunnescentes leniter multo costati vel subteretes dense pilosi et puberuli. Folia alterna raro in ramis opposita sessilia vel subsessilia lineari-oblonga inferiora ad 8 cm longa et 0.9 cm lata superiora decrescentia base anguste rotundata vel breviter obtusa margine integra anguste recurvata apice breviter acuta minute apiculata supra dense subscabridula et glandulo-punctata subtus dense minute glandulo-punctata et plerumque in nervis et nervulis puberula, nervis secundariis utrinque ca. 12 brevibus erecto-patentibus leniter arcuatis. Inflorescentiae terminales corymbosae vel pyramidaliter paniculatae multo ramosae, ramis divaricate cymosis, internodiis dense minute pilosis, bracteis minutis indistinctis. pedicellis in capitulis inferioribus nullis in capitulis ultimis ad 5-8 mm longis. Capitula anguste campanulata 7-9 mm alta et 5-7 mm lata; squamae involucri brunnescentes vel in partibus virescentes ca. 25 subimbricatae ca. 5-seriatae appressae anguste ovatae vel oblongo-lanceolatae 1.0-4.5 mm longae et 0.5-1.2 mm latae apice breviter acutae minute apiculatae in bracteis interioribus leniter recurvatae margine scariosae sparse pilosulo-fimbriatae extus sparse evanescentiter puberulae superne obscure glandulo-punctatae; receptacula dense breviter tomentosa. Flores ca. 11 in capitulo. Corollae lavandulae 7.5-8.5 mm longae extus glabrae, tubis anguste cylindraceis ca. 4 mm longis, faucibus vix infundibularibus ca. 1.5 mm longis, lobis lineari-lanceolatis ca. 3 mm longis base 0.6 mm latis; thecae antherarum ca. 2.7 mm longae; appendices antherarum lanceolatae ca. 0.6 mm longae et 0.2 mm

latae extus abaxialiter non glanduliferae pauce minute papillosoe; basi stylorum leniter breviter nodulosi; scapi stylorum in partibus breviter hispidulis superioribus subnulli ad 0.5 mm longi. Achaenia ca. 2.2-2.4 mm longa in costis dense breviter hispidulo-setifera inter costas dense pustulifera, pustulis 1-3-cellularibus; setae pappi albae persistentes ca. 50 plerumque ca. 6 mm longae plerumque in marginem dense scabridulae, series exteriores setiformes facile deciduae ca. 0.5-1.0 mm longae dense minute scabridulae. Grana pollinis in diametro ca. 37  $\mu$ m irregulariter areolata et spinulosa (*Lychmophora*-Type).

TYPE: BRASIL: Distrito Federal: 32 km N of the bridge at Asa Norte in Brasília on the road to Alto Paraiso. Wet savanna area bordering stream at an elevation of 2250 ft. Shrub 2 m tall; florets lavender. Jan. 19, 1980. *R.M.King & F.Almeda 8208* (Holotype, UB; isotype US). PARATYPES: BRASIL: Distrito Federal: Riberão Bananal, Brasília. Elev. 975 m. Disturbed gallery forest. Shrub ca. 1 m tall. Heads lilac. Only one seen. Jan. 8, 1966. *H.S.Irwin, R.Souza, & R.Reis dos Santos 11484* (NY); Cerrado slopes near Córrego Corguinho, immediately east of Sobradinho. Elev. 1000 m. Erect herb ca. 1.5 m tall. Heads lavender-purple. Jan. 25, 1966. *H.S.Irwin, R.Souza & R.Reis dos Santos 12007* (US); Chapada da Contagem, ca. 15 km E of Brasília. Elev. 1050 m. Cerrado. Herb ca. 1 m tall. Heads rose-lavender. Jan. 30, 1966. *Irwin et al. 12150* (US).

*Vernonia almedae* belongs in the large group related to *V. polyanthes* Less., but is rather distinctive in its more oblong or linear leaves and its more elongate involucre bracts. The new species somewhat resembles *V. westiniana* Less. and *V. subpaludosa* Malme. The Lessing species differs by its distinct petioles and non-glanduliferous tomentellous leaf undersurfaces. The Malme species differs by its mostly 7-flowered heads and glabrous upper leaf surfaces.

#### VERNONIA CLEOCALDERONAE H. Robinson, sp. nov.

Plantae suffruticosae ca. 1 m altae pauce ramosae. Caules leniter striati canescentiter dense appresse puberuli, pilis in cellulis principalibus subulatis obliquis interdum sub-T-formibus. Folia alterna, petiolis ad 7 mm longis; laminae ellipticae vel obovatae ad 7 cm longae ad 3 cm latae superne decrescentes base acutae vel vix acuminatae margine plerumque integrae ad apicem leniter sinuatae vel sub-trilobatae apice obtusae supra dense breviter appresse tenuiter puberulae subtus pallidiores dense glandulo-punctatae dense breviter appresse puberulae, nervis secundariis 5-8 mediocriter patentibus leniter arcuatis. Inflorescentiae multo ramosae, ramis breviter serialiter cymosis internodis sensim tenuibus, pilis dense breviter appresse puberulis, bracteis aliquantum foliiformibus in ramis distalibus aliquantum minutis 3-10 mm longis et 1-3 mm latis. Capitula axillaris vel extra-axillaria solitaria sessilia vel breviter pedicellata raro in pedicellis ad 7 mm longis ca. 8 mm alta et lata; squamae

involucri extus superne brunnescentes inferne et margine pallidiores ca. 44 subimbricatae ca. 5-seriatae appressae vel subappressae oblongae vel oblongo-lanceolatae 0.5-5.0 mm longae et 0.3-1.2 mm latae apice breviter acutae interiores argute acutae margine subscariosae vix fimbriatae extus dense breviter sericeae. Flores ca. 13 in capitulo. Corollae lavandulae ca. 6.0-6.5 mm longae, tubis ca. 3.0-3.5 mm longis cylindratis extus glabris, faucibus ca. 1 mm longis leniter infundibularibus extus glabris vel persparse pilosis, lobis oblongo-lanceolatis 2.0-2.5 mm longis et 0.5-0.6 mm latis superne sensim dense breviter sericeis; thecae antherarum ca. 2 mm longae; appendices antherarum anguste ovatae ca. 0.5 mm longae et 0.18 mm latae; basi stylorum subdisciformes; scapi stylorum in partibus hispidulis superioribus ca. 0.5 mm longis. Achaenia 2.7-3.0 mm longa inter costis dense breviter setifera et dense pustulifera, pustulis plerumque uni-cellularibus; setae pappi albae aliquantum facile deciduae ca. 30-35 plerumque 4.5 mm longae apice vix vel non latiores margine et extus minute scabridulae, squamae exteriores distinctae lanceolatae ca. 1 mm longae et 0.10-0.15 mm latae margine dense scabridulae extus sparse minute scabridulae. Grana pollinis in diametro ca. 40  $\mu$ m valde lophorata, cristis altis minute multo spinuliferis, spinis majoribus nullis (reticulation *V. cognata*-Type).

TYPE: BRASIL: Amazonas: Transamazon Highway, 53 km W of Aripuanã River; "campina" region. In open campina of white sandy soil. Shrub up to 2 m tall with flowers lilac-violet color. June 27, 1979. *Cleofe E. Calderon, O.P. Monteiro & J. Guedes 2689* (Holotype, INPA; isotype, US).

The pubescence of *Vernonia cleocalderonae* suggests relation to species having *V. arenaria*-Type pollen, many of which have T-formed a sub-T-formed hairs. The pollen of the new species, however, is of the *V. cognata*-Type. Of the species having the latter type of pollen, the *V. lilacina* Mart.-*V. salzmannii* DC.-*V. silvae* sp. nov. series has only simple hairs, and the *V. cognata* group is notably sericeous. The new species is individually distinctive in the irregularly multi-branched inflorescence with variously pedicellate to sessile heads. The broadly elliptical to obovate leaves with sometimes slightly trilobed tips are also rather distinctive.

#### VERNONIA EITENII H. Robinson, sp. nov.

Plantae herbaceae perennes erectae ca. 4.5 dm altae non ramosae. Caules leniter pentagonales dense sordide tomentosi. Folia alterna sessilia anguste elliptica vel oblanceolata inferne ad 7.5 cm longa et 1.8 cm lata superne decrescentia base cuneata margine integra vel superne paucis subrenulata apice obtusa vel anguste rotundata supra dense scabrida subtus dense pallide tomentosa, nervis secundariis utrinque 5-6 valde ascendentibus. Inflorescentiae breviter racemiformiter cymosae 4-5-capitatae in nodis non deflectis in internodiis dense sordide tomentosae, bracteis sub-foliiformibus anguste oblongis 1-2 cm longis et 0.3-

0.4 cm latis. Capitula axillares in pedicellis 9-25 mm longis dense sordide tomentosus solitaria late campanulata; involucri ca. 9-11 mm alta et lata; squamae involucri inferne virides in apices purpureo-tinctae ca. 100 subimbricatae 5-6-seriatae appressae in apicibus junioribus interdum leniter incurvatae in squamis interioribus maturis leniter recurvatae; squamae anguste ovatae vel lanceolatae 3-10 mm longae et 1-2 mm latae apice argute acutae non acuminatae extus et margine sparse aut evanescentiter sordide pilosulae inferne et margine induratae superne subdistinctae uni-costatae margine dense scabrido-serrulatae. Flores ca. 45 in capitulo. Corollae magentae ca. 11 mm longae, tubis inferne anguste superne distincte infundibularibus ca. 5.5-6.0 mm longis extus superne sparse glanduliferis, faucibus ca. 1.2 mm longis subcylindraceis sparse breviter stipitato-glanduliferis, lobis linearibus ca. 3.5-3.8 mm longis ca. 0.6 mm latis extus plerumque glabris apice dense breviter spiculiferis; thecae antherarum ca. 3 mm longae; appendices antherarum oblongo-ovatae ca. 0.45 mm longae et 0.23 mm latae apice rotundatae abaxialiter glabrae; basi stylorum non noduliferi; scapi stylorum in partibus superioribus sparse hispidulis 0.5-1.0 mm longi. Achaenia submatura 1.8 mm longa dense longe setifera; setae pappi ca. 40 plerumque 6.5 mm longae superne distincte clavatae inferne plerumque in marginis scabridulae apice margine et extus dense scabridulae, scabridulis distincte apiculatis; series exteriores setiformes vel anguste squamiformes ca. 2 mm longae extus sublaeves. Grana pollinis leniter oblata ca. 55  $\mu$ m alta et ca. 60  $\mu$ m lata valde lophorata, cristis altis minute multo spinuliferis, spinis majoribus nullis (reticulation *V. argyrophylla*-Type).

TYPE: BRASIL: Distrito Federal: Chapada da Contagem. 23 km NW of the central sector of Brasilia. Wet campo (seasonal marsh) at 3400 ft. elev. Suffrutescent herb 0.5-1.0 m tall. Florets magenta. Jan. 26, 1980. *R.M.King, F.Almeda & G.Eiten 8313* (Holotype, UB; isotype US). PARATYPE: BRASIL: Distrito Federal: Chapada da Contagem, ca. 10 km E of Brasília. Elev. 1000 m. Cerrado. Herb ca. 1 m tall. Heads magenta. Dec. 17, 1965. *H.S.Irwin, R.Souza & R.Reis dos Santos 11364* (NY, US).

The vegetative habit and the series of pedicellate heads in *Vernonia eitenii* both resemble those of *V. secunda* Sch.Bip. ex Baker, but the former clearly differs by the presence of distinct bracts in the inflorescence, by the order of maturation of the heads in the inflorescence, and by details of the involucrial bracts and florets. The new species seems more closely related to the recently described *V. irwinii* Barroso and *V. cristalinae* H.Robins., both from the general region of the Federal District. The three species share the same general habit, the uncostate involucrial bracts, the short pappus with exserted throats of the corollas, and the distinct apiculate tips on the barbules of the pappus setae. The new species differs by the regularly pedicellate heads and by the much shorter-tipped involucrial bracts. The broad tips of the pappus setae are more like *V. cristalinae*, but

the latter species seems to have only 1 or 2 heads in the inflorescence.

The immediate species group seems to have inflorescences in which the internodes represent a continuation of the main axis and the heads are axillary. This is reflected in the order of maturation of the heads, the upper heads maturing first and the lowest heads last. In most members of the genus, including the comparatively closely related *V. bardanoides* Less., the lower heads mature first. In these species the individual heads are apparently terminal and the inflorescence is continued by axillary innovations.

VERNONIA PARAENSIS H. Robinson, sp. nov.

Plantae herbaceae erectae ca. 5-6 dm altae non ramosae. Caules obscuro-virides ca. 7-8 angulati superne sparse pilosuli et inter costis minute glandulo-punctati inferne glabrescentes. Folia alterna, petiolis indistinctis; laminae subcarnosae lineares inferne ad 5.5 cm longae et 0.6 cm latae superne decrescentes et subfiliformes base sensim angustatae subpetioliformes margine integrae apice acutae supra et subtus multo minute glandulo-punctatae et sparse interdum evanescentiter pilosae, nervis primariis subtus leniter exsculptis, nervis secundariis obscuris valde ascendentibus. Inflorescentiae terminales subscaposae dense cymosae in nodis vix vel distincte deflectis, internodis appresse vel subappresse pilosulis. bracteis minutis vel nullis. Capitula solitaria interdum congesta plerumque sessilia interdum in ramis usque ad 1 cm longis plerumque 8-9 mm alta et lata; squamae involucri ca. 25 subimbricatae 4-5-seriatae oblongo-ovatae vel oblongo-lanceolatae 1-6 mm longae et 0.7-1.5 mm latae apice breviter acutae minute apiculatae extus plerumque brunnescentes dense breviter sericeae obscure minute glanduliferae margine pallidiores subscariosae dense pilosulo-fimbriatae; receptacula plana dense breviter hirsuta. Flores ca. 15-20 in capitula. Corollae roseae 8.5-9.5 mm longae, tubis inferne angustatis superne anguste infundibularibus 3.5-4.5 mm longis extus glabris, faucibus ca. 0.5 mm longis extus sparse sericeis, lobis linearibus 4.5-5.0 mm longis et ca. 0.5 mm latis extus sericeis superne densioribus; thecae antherarum ca. 2.5 mm longae; appendices antherarum oblongae vel oblongo-ovatae ca. 0.40-0.45 mm longae et ad 0.2 mm latae breviter obtusae vel irregulariter truncatae abaxialiter glabrae; basi stylorum leniter nodulosi; scapi stylorum in partibus superioribus sparse hispidulis ca. 2 mm longi. Achaenia submatura ca. 2.0-2.5 mm longa inter costas longe setifera inferne glabra; setae pappi persistentes ca. 25-27 plerumque ca. 5 mm longae apice tenuiores margine inferne perdense late scabrido-fimbriatae extus vix vel sparse scabridulae, squamae exteriores lineares ca. 1 mm longae et ad 0.18 mm latae margine perdense late scabrido-fimbriatae extus sparse scabridulae vel sublaeves. Grana pollinis in diametro ca. 40-42  $\mu$ m irregulariter areolata et spinulosa (*Lychnophora*-Type).

TYPE: BRASIL: Para: Maraba, Serra dos Carajas, \_\_\_\_\_ para o n.1. Campo, arredores de aeroporto. Arbusto de 60 cm, flor rosa. 2/4/1977. *M.G.Silva & R.Bahia 3013* (Holotype, INPA; isotypes, MG, NY, US).

*Vernonia paraensis* has a general habit that is most closely approached by various members of the *V. cognata* group, especially *V. lithospermifolia* Hieron. However, the new species has a pollen type and receptacle pubescence that would indicate closer relation to the *V. polyanthes* and *V. scorpioides* groups. The corolla pubescence of the new species is most like the latter group. Nevertheless, the narrow, glabrous, subcarnose leaves and the small cymose inflorescences are thoroughly distinctive, and the closest relationship of the species remains uncertain.

VERNONIA SILVAE H. Robinson, sp. nov.

Plantae suffruticosae ad 6 dm altae multo ramosae. Caules brunnescentes subteretes leniter striati in partibus parce costati antrorse appresse pilosi. Folia alterna, petiolis indistinctis; laminae lineari-ellipticae plerumque 2.5-4.0 cm longae et 0.2-0.3 cm latae base sensim perangustatae margine integrae apice anguste acutae supra et subtus appresse pilosulae et dense glandulopunctatae, nervis secundariis 5 aut 6 obscuris brevibus valde ascendentibus. Inflorescentiae serialiter cymosae in nodis vix deflectis in internodis bracteis et squamis involucri appresse pilosae, bracteis foliiformibus. Capitula in nodis solitaria axillaria vel plerumque supra-axillaria campanulata ca. 9 mm alta et 6-8 mm lata; squamae involucri ca. 40 subimbricatae 5-6-seriatae exteriores lineari-lanceolatae 3-6 mm longae et 0.5-1.0 mm latae apice longe aristatae extus in medio unicostatae superne glandulopunctatae margine anguste scariosae et minute spiculiferae interiores oblongo-lanceolatae 7-8 mm longae apice acuminatae breviter aristatae margine late scariosae inferne integrae superne minute puberulo-fimbriatae. Flores ca. 20 in capitulo. Corollae lavandulae 7.5-8.0 mm longae, tubis perangustatis superne vix infundibularibus 4 mm longis extus sparce breviter stipitato-glanduliferis, faucibus infundibularibus ca. 0.8 mm longis extus sparce pilosis, lobis linearibus ca. 2.5-3.0 mm longis et 0.45 mm latis extus glandulopunctatis et pilosis superne densioribus; thecae antherarum ca. 2 mm longae; appendices antherarum anguste ovatae ca. 0.6 mm longae et base 0.18 mm latae apice acutae extus glabrae; basi stylorum leniter noduliferi; scapi stylorum in partibus hispidulis superioribus ca. 1 mm longi. Achaenia submatura ca. 1.2 mm longa dense longe setifera obscure sparce minute glandulifera; setae pappi subpersistentes ca. 22 plerumque 3.7-4.2 mm longae apice vix vel non latiores margine et extus dense scabridulae, squamae exteriores oblongo-lineares ca. 0.7-1.0 mm longae et 0.10-0.14 mm latae extus distincte scabridulae. Grana pollinis in diametro ca. 40  $\mu$ m valde lophorata, cristis altis minute spinuliferis, spinis majoribus nullis (*V. cognata*-Type).

TYPE: BRASIL: Para: Rio Araguaia, Ilha em frente ao Rio Piranha, vegetação de várzea, solo de areia branca. Planta de 60 cm de altura, capítulos lilás. 10/VIII/1978. *N.T.Silvae* 4780 (Holotype, INPA, isotypes NY, US).

*Vernonia silvae* has heads with a differentiated outer series of spreading slender bracts as in *V. remotiflora* Rich. and some members of the *V. geminata* group. The new species differs from both of the latter groups, however, by having *V. cognata*-Type pollen. The narrow leaves, the form of the involucre, and the fine appressed pubescence distinguish the species from others having similar pollen. The new species is clearly not a member of either the *V. cognata* or the *V. salzmannii*-*V. lilacina*-*V. cotton-easter* groups which contain most of the species with *V. cognata*-Type pollen, and it may prove to be more closely related to *V. remotiflora* which has pollen of the *V. argyrophylla*-Type.



*Vernonia almedae* H. Robinson, Holotype, Herbário Universidade de Brasília. Photos by Victor E. Krantz, Staff Photographer, National Museum of Natural History.





*Vernonia cleocalderonae* H. Robinson, Isotype, United States National Herbarium.



*Vernonia eitenii* H. Robinson, Holotype, Herbário Universidade de Brasília.



*Vernonia paraensis* H. Robinson, Isotype, United States National Herbarium.



*Vernonia silvae* H. Robinson, Isotype, United States  
National Herbarium.



Enlargements of heads of *Vernonia*. Top. *V. almedae*, *V. paraensis*. Middle. *V. cleocalderonae*, *V. silvae*. Bottom. *V. eitenii*.